Amendments to the Claims

1. (Currently amended) A method for inhibiting platelet activation and recruitment in a mammal in need of such treatment comprising administering an effective amount of a soluble CD39 polypeptide ~~having~~ consisting of a structure X-Y wherein X is ~~selected from the group consisting of~~ an Ala residue or ~~and~~ heterologous peptides selected from the group consisting of amino acids 1-15 of SEQ ID NO:6, amino acids 25-35 of SEQ ID NO:28, amino acids 27-34 of SEQ ID NO:29, and amino acids 21-24 of SEQ ID NO:30 ~~capable of adopting a stable secondary structure~~ and Y is selected from the group consisting of:

~~(a) polypeptides having an amino acid sequence as set forth in (SEQ ID NO:2) wherein the amino terminus is selected from the group consisting of amino acids 36-44, and the carboxy terminus is selected from the group consisting of amino acids 471-478;~~

~~(b) fragments of the polypeptides of (a) wherein said fragments have apyrase activity; and~~

~~(c) variants of the polypeptides of (a) or (b), wherein said variants have apyrase activity.~~

(a) a polypeptide consisting of amino acids 36-478 of SEQ ID NO:2;

(b) a fragment of the polypeptide of (a) consisting of consecutive amino acids of (a) wherein said fragment has apyrase activity;

(c) a variant polypeptide that is at least 95% identical in amino acid sequence to (a) or (b) wherein said variant polypeptide has apyrase activity; and

(d) a substituted polypeptide consisting of the amino acids of (a), (b), or (c) with at least one conservative amino acid substitution wherein said substituted polypeptide has apyrase activity.

2. (Currently amended) The method of claim 1 wherein Y is a ~~selected from the group consisting of:~~

~~(a)~~ polypeptides ~~having a sequence~~ consisting of amino acids 38-476 or 39-476 of SEQ ID NO:2~~;~~

~~(b) variant polypeptides that are at least 70% identical in amino acid sequence to amino acids 36 to 478 of SEQ ID NO:2 or to a fragment thereof, wherein said variant polypeptides have apyrase activity;~~

~~(c) variant polypeptides that are at least 80% identical in amino acid sequence to amino acids 36 to 478 of SEQ ID NO:2 or to a fragment thereof, wherein said variant polypeptides have apyrase activity;~~

~~(d) variant polypeptides that are at least 90% identical in amino acid sequence to amino acids 36 to 478 of SEQ ID NO:2 or to a fragment thereof, wherein said variant polypeptides have apyrase activity;~~

~~(e) variant polypeptides that are at least 95% identical in amino acid sequence to amino acids 36 to 478 of SEQ ID NO:2 or to a fragment thereof, wherein said variant polypeptides have apyrase activity;~~

~~(f) variant polypeptides that are at least 98% identical in amino acid sequence to amino acids 36 to 478 of SEQ ID NO:2 or to a fragment thereof, wherein said variant polypeptides have apyrase activity; and~~

~~(g) variant polypeptides that are at least 99% identical in amino acid sequence to amino acids 36 to 478 of SEQ ID NO:2 or to a fragment thereof, wherein said variant polypeptides have apyrase activity~~.

3. (Currently amended) The method of claim 1 wherein X is ~~a peptide fragment from the amino terminal portion of mature IL-2, CD39-L2, CD39-L3, or CD39-L4.~~ selected from the group consisting of:

(a) amino acids 1-15 of SEQ ID NO:6, amino acids 25-35 of SEQ ID NO:28, amino acids 27-34 of SEQ ID NO:29, and amino acids 21-24 of SEQ ID NO:30;

(b) a fragment consisting of consecutive amino acids of any of the amino acid sequences of (a) wherein said X-Y polypeptide has apyrase activity;

(c) a variant polypeptide that is at least 95% identical in amino acid sequence to (a) or (b) wherein said X-Y polypeptide has apyrase activity; and

(d) a substituted polypeptide consisting of the amino acids of (a), (b), or (c) with at least one conservative amino acid substitution wherein said X-Y polypeptide has apyrase activity.

4. (Cancelled)

5. (Currently amended) A method of inhibiting platelet activation and recruitment in a mammal in need of such treatment comprising administering an effective amount of a soluble CD39 polypeptide selected from the group consisting of:

~~(a)~~ SEQ ID NO: 6, amino acids 25-464 of SEQ ID NO:27, amino acids 25-474 of SEQ ID NO:28, amino acids 27-473 of SEQ ID NO:29~~, amino acids 21-476 of SEQ ID NO:3, amino acids 21-476 of SEQ ID NO:4, or~~ and amino acids 21-463 of SEQ ID NO:30; ~~and~~

~~(b) fusion polypeptides comprising the polypeptides of (a), wherein said fusion polypeptides have apyrase activity~~.

6. (Cancelled)

7. (Currently amended) The method of claim ~~6~~ 5 wherein the soluble CD39 polypeptide has the sequence of amino acids 21-463 of SEQ ID NO: 30.

8-18 (canceled).

19. (Withdrawn) A method for degrading nucleoside tri- and/or di- phosphates in a mammal in need of such treatment comprising administering an effective amount of a soluble CD39 polypeptide having a structure X-Y wherein X is selected from the group consisting of an Ala residue and heterologous peptides capable of adopting a stable secondary structure and Y is selected from the group consisting of:

(a) polypeptides having an amino acid sequence as set forth in (SEQ ID NO:2) wherein the amino terminus is selected from the group consisting of amino acids 36-44, and the carboxy terminus is selected from the group consisting of amino acids 471-478;

(b) fragments of the polypeptides of (a) wherein said fragments have apyrase activity; and

(c) variants of the polypeptides of (a) or (b), wherein said variants have apyrase activity.

20. (Currently amended) ~~A~~ The method according to Claim 1 wherein the soluble CD39 polypeptide has been produced by culturing a recombinant cell that ~~encodes~~ expresses the soluble CD39 polypeptide under conditions permitting expression of the CD39 polypeptide, and recovering the expressed CD39 polypeptide.

21. (Currently amended) ~~A~~ The method according to Claim 5 wherein the soluble CD39 polypeptide has been produced by culturing a recombinant cell that ~~encodes~~ expresses the soluble CD39 polypeptide under conditions permitting expression of the CD39 polypeptide, and recovering the expressed CD39 polypeptide.

22. (Previously presented) The method of claim 20 wherein the recombinant cell comprises a nucleic acid having a sequence selected from the group consisting of:

(a) SEQ ID NO:5; and

(b) DNA sequences which, due to degeneracy of the genetic code, encode the polypeptide encoded by SEQ ID NO:5.

23. (Previously presented) The method of claim 21 wherein the recombinant cell comprises a nucleic acid having a sequence selected from the group consisting of:

(a) SEQ ID NO:5; and

(b) DNA sequences which, due to degeneracy of the genetic code, encode the polypeptide encoded by SEQ ID NO:5.

24. (Previously presented) The method of claim 20 wherein the recombinant cell comprises a nucleic acid having a sequence selected from the group consisting of:

(a) SEQ ID NO:7; and

(b) DNA sequences which, due to degeneracy of the genetic code, encode the polypeptide encoded by SEQ ID NO:7.

25. (Previously presented) The method of claim 21 wherein the recombinant cell comprises a nucleic acid having a sequence selected from the group consisting of:

(a) SEQ ID NO:7; and

(b) DNA sequences which, due to degeneracy of the genetic code, encode the polypeptide encoded by SEQ ID NO:7.

26. (Previously presented) The method of Claim 1 wherein the soluble CD39 polypeptide is administered in a composition comprising a pharmaceutically acceptable carrier.

27. (Previously presented) The method of Claim 5 wherein the soluble CD39 polypeptide is administered in a composition comprising a pharmaceutically acceptable carrier.

28. (Previously presented) The method of Claim 1 wherein the soluble CD39 polypeptide is administered in combination with at least one other antithrombotic or antiplatelet composition.

29. (Previously presented) The method of Claim 5 wherein the soluble CD39 polypeptide is administered in combination with at least one other antithrombotic or antiplatelet composition.

30. (Previously presented) The method of claim 1 wherein the soluble CD39 polypeptide is administered in combination with aspirin.

31. (Previously presented) The method of claim 5 wherein the soluble CD39 polypeptide is administered in combination with aspirin.

32. (Previously presented) The method of Claim 1 wherein the soluble CD39 polypeptide is administered parenterally.

33. (Previously presented) The method of Claim 5 wherein the soluble CD39 polypeptide is administered parenterally.

34. (Previously presented) The method of claim 1 wherein the soluble CD39 polypeptide is administered intravenously.

35. (Previously presented) The method of claim 5 wherein the soluble CD39 polypeptide is administered intravenously.

36. (Previously presented) The method of Claim 1 wherein the mammal is suffering from unstable angina, myocardial infarction, stroke, coronary artery disease or injury, myocardial infarction, atherosclerosis, peripheral vascular occlusion, preeclampsia, embolism, a platelet-associated ischemic disorder including lung ischemia, coronary ischemia, and cerebral ischemia, a thrombotic disorder including coronary artery thrombosis, cerebral artery thrombosis, intracardiac thrombosis, peripheral artery thrombosis, venous thrombosis, thrombosis and coagulopathy associated with exposure to a foreign or injured tissue surface, deep venous thrombosis (DVT), pulmonary embolism (PE), transient ischemic attack (TIAs), or another related condition where vascular occlusion is the common underlying feature.

37. (Previously presented) The method of Claim 5 wherein the mammal is suffering from unstable angina, myocardial infarction, stroke, coronary artery disease or injury, myocardial infarction, atherosclerosis, peripheral vascular occlusion, preeclampsia,

embolism, a platelet-associated ischemic disorder including lung ischemia, coronary ischemia, and cerebral ischemia, a thrombotic disorder including coronary artery thrombosis, cerebral artery thrombosis, intracardiac thrombosis, peripheral artery thrombosis, venous thrombosis, thrombosis and coagulopathy associated with exposure to a foreign or injured tissue surface, deep venous thrombosis (DVT), pulmonary embolism (PE), transient ischemic attack (TIAs), or another related condition where vascular occlusion is the common underlying feature.

38. (Previously presented) The method of Claim 1 wherein the soluble CD39 is administered to prevent thrombus formation or reformation, occlusion, reocclusion, stenosis, or restenosis of blood vessels, or stroke.

39. (Previously presented) The method of Claim 5 wherein the soluble CD39 is administered to prevent thrombus formation or reformation, occlusion, reocclusion, stenosis, or restenosis of blood vessels, or stroke.

40. (Previously presented) The method of Claim 1 wherein the soluble CD39 is administered in conjunction with angioplasty, carotid endarterectomy, anastomosis of vascular graft, atherectomy, stent placement, placement of a chronic cardiovascular device such as an in-dwelling catheter or prosthetic valve or vessel, or bypass surgery.

41. (Previously presented) The method of Claim 5 wherein the soluble CD39 is administered in conjunction with angioplasty, carotid endarterectomy, anastomosis of vascular graft, atherectomy, stent placement, placement of a chronic cardiovascular device such as an in-dwelling catheter or prosthetic valve or vessel, or bypass surgery.